

Table 7
UPS-to-system monitor alarm cables

UPS vendor	Cable part number	Quantity
Alpha Technologies	NT8D46AU	one per UPS
Best Power Technology	NT8D46AJ	one per UPS
Exide Electronics	NT8D46AQ	one per UPS

DC reserve power

Reserve power for DC systems is provided by adding batteries to the external power distribution system. Calculate reserve battery capacity as shown in “UPS sizing” on page 43. This determines the total ampere-hour requirements of the batteries (see also “Component power consumption” on page 85).

To comply with safety requirements, read and fully understand the following documents before working with any battery systems:

- OSHA “Material Safety Data Sheet” that must be posted to meet OSHA requirements. This document outlines safe reserve battery handling procedures.
- National Electric Code 645-10. This document outlines requirements that call for the installation of AC- and DC-power kill switches to battery systems in certain environments.

Current requirements

The DC current required for battery reserves is based on the total system power requirement. For new installations you can determine power and battery requirements from data provided by Nortel Networks. For existing installations, see “Component power consumption” on page 85 for information on calculating current required for battery reserves.

Batteries

The reserve battery capacity required depends on the system line size (load), the time the reserve supply must last in the event of a power failure, and the battery end voltage. Table 8 gives guidelines for reserve battery float and equalization voltages. These voltages must never be more negative than -56.5 V.

Table 8
Battery requirements

Battery configuration	Float voltage (V)		Equalize voltage (V)	
	Cell	Bank	Cell	Bank
24 stationary cells	-2.17	-52.08	-2.25	-54.00
23 sealed cells	-2.25	-51.75	-2.35	-54.05
24 sealed cells	-2.25	-54.00	-2.35	-56.40

Lead-calcium/absolyte batteries

Battery package provisioning is based on the number of Amp-hours required. Since battery package Amp-hour ratings are generally given at an eight hour discharge rate, adjustment factors are required to determine the required battery package. Table 9 lists adjustment factors for lead-calcium and absolyte batteries. These factors are based on the discharge rates of the respective battery types from a specific supplier. Discharge characteristics may vary by manufacturer.

Table 9
Adjustment factors for lead-calcium and absolyte batteries (Part 1 of 2)

Reserve Hours	Lead Calcium Factor	(Sealed) Absolyte Factor
1	3.0	1.8
2	4.0	3.1
3	5.0	4.2

Note: If a system requires more than 10 hours of backup, the factor is linear. For example, if 15 hours are required, the factor is 15.

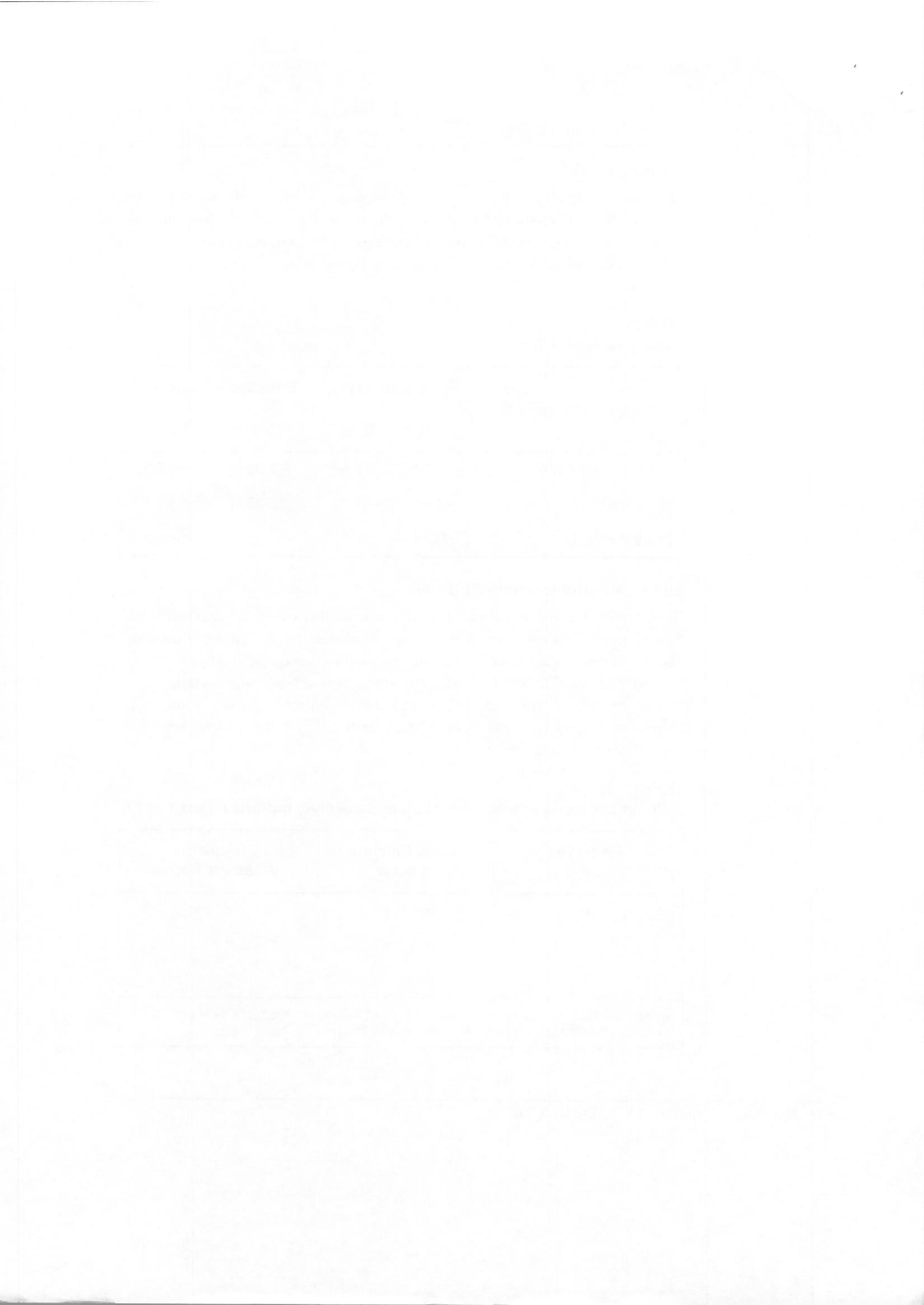


Table 9
Adjustment factors for lead-calcium and absolyte batteries (Part 2 of 2)

Reserve Hours	Lead Calcium Factor	(Sealed) Absolyte Factor
4	5.9	5.2
5	6.9	6.2
6	7.7	7.1
7	8.5	7.8
8	9.3	8.5
9	10.1	9.4
10	10.9	10.2

Note: If a system requires more than 10 hours of backup, the factor is linear. For example, if 15 hours are required, the factor is 15.

Calculate battery requirement using this formula:

$$\text{Ahr} = I_L \times F_{\text{adj}}$$

where

Ahr = battery requirement in amp-hours

I_L = system load, in amps

F_{adj} = appropriate adjustment factor from Table 9

When using lead-calcium or sealed batteries, calculate battery recharge time using this formula:

$$T = \frac{\text{Ahr} \times 1.15}{I_{\text{RO}} - I_L}$$

where

T = battery recharge time

Ahr = battery capacity in amp-hours

I_L = total system load, in amps

I_{RO} = total rectifier output, in amps

Other battery considerations are:

- Not all sealed cells require equalization, but equalization voltage can be used for fast charging. Use a battery end voltage of 44 V when choosing battery banks.
- Use these electrical noise limitations for a battery bank:
 - 20 mV rms maximum ripple
 - 32 dBnC maximum noise
- CEMF cells are not recommended because the noise they generate is unacceptable.

Table 19 shows power consumption data for each fully configured module. Use this data for rectifier and reserve power (battery) calculation.

Table 19
Meridian 1 module power consumption

Module	Power consumption (watts)
NT5D21 Core/Network Module	260
NT5K11 Enhanced Existing Peripheral Equipment (EEPE) Module	375
NT6D39 CPU/Network Module	360
NT6D44 Meridian Mail Module	240
NT6D60 Core Module	260
NT8D11 CE/PE Module	500
NT8D13 PE Module	240
NT8D34 CPU Module	260
NT8D35 Network Module	240
NT8D36 InterGroup Module	0
NT8D37 IPE Module	460
NT8D47 RPE Module:	
— local site	175
— remote site	100
NT9D11 Core/Network Module	260
Application Equipment Module	
— single	210
— dual	420
Pedestal (with blower unit)	50



Figure 26
Worksheet A—System power consumption worksheet

SYSTEM POWER CONSUMPTION WORKSHEET					
Module	Quantity		Module power consumption		Total module power consumption
NT6D39	_____	X	360	=	_____
NT6D44	_____	X	240	=	_____
NT6D60	_____	X	260	=	_____
NT8D11	_____	X	500	=	_____
NT8D13	_____	X	240	=	_____
NT8D34	_____	X	260	=	_____
NT8D35	_____	X	240	=	_____
NT8D37	_____	X	340	=	_____
NT8D47	_____	X	175	=	_____
Pedestals	_____	X	50	=	_____
Total real power (watts)				=	_____

Current drain:

AC system:

$$\frac{\text{(total real power)}}{\text{(nominal AC voltage)} \quad 208} = \text{_____ amperes, AC}$$

DC system:

$$\frac{\text{(total real power)}}{\text{(nominal AC voltage)} \quad 52} = \text{_____ amperes, DC}$$

Complex (or apparent power) (AC only):

$$\frac{\text{(total real power)}}{\text{(power factor)} \quad 0.6} = \text{_____ volt-amperes (VA)}$$

553-5833

